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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,820	08/25/2003	Seiji Aida	241784US0	1812

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,820

Applicant(s)

AIDA, SEIJI

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/25/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3-4, 8, 10-11, 14, and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Nadolsky (U.S. 6,841,592).

Nadolsky discloses ink comprising maleated hydrocarbon prepared by grafting maleic anhydride and/or partial maleate ester to hydrocarbon wherein the hydrocarbon includes α -olefin containing more than 20 carbon atoms while the partial maleate ester is produced by reacting maleic anhydride with C₁-C₄ alkyl alcohol, i.e. C₁-C₄ monoalkyl maleate. It is disclosed that the maleated hydrocarbon is prepared by reacting the olefin with maleic anhydride to form copolymer of α -olefin and maleic anhydride to which is grafted additional maleate, which as described above, includes monoalkyl maleate. There is also disclosed process of dispersing a pigment in aqueous medium in the presence of dispersion formed by dispersing the maleated hydrocarbon in water in the presence of base (col.2, lines 27-20 and 43-55,, col.2, line 61-col.3, line 6, col.3, lines 30-34 and 57-64, and Table A).

With respect to present claims 1 and 8, it is noted that Nadolsky produces aqueous pigment dispersion by dispersing monoalkyl maleate graft polymer of maleic anhydride/ α -olefin in water in the presence of aqueous medium and base followed by adding the resulting polymer to pigment while present claims 1 and 8 require dispersion formed by dispersing monoalkyl maleate graft polymer of maleic anhydride/ α -olefin in water in the presence of aqueous medium, base, and pigment. However, although Nadolsky does not disclose claimed process for forming dispersion, it is noted that “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process”, *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, “although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product”, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

Therefore, given that Nadolsky meets the requirements of the claimed pigment dispersion, Nadolsky clearly meets the requirements of the present claims.

In light of the above, it is clear that Nadolsky anticipates the present claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 2, 9, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nadolsky (U.S. 6,841,592) in view of Ohta et al. (U.S. 5,954,866).

The disclosure with respect to Nadolsky in paragraph 2 above is incorporated here by reference.

The difference between Nadolsky and the present claimed invention is the requirement in the claims of glycol monoalkyl ether.

Nadolsky discloses that the pigment dispersion or ink comprises aqueous medium including organic solvent, i.e. humectant, however, there is no disclosure of glycol monoalkyl ether as presently claimed.

Ohta et al., which is drawn to inks, disclose the use of humectant such as triethylene glycol monobutyl ether in order to prevent clogging of the printer nozzles and improve moisture retention and storage stability (col.8, lines 36-39 and 42-49). Ohta et al. also disclose the equivalence and interchangeability of humectant that is ethylene glycol, as disclosed by Nadolsky, and triethylene glycol monobutyl ether, i.e. glycol monoalkyl ether, as presently claimed.

In light of the motivation for using glycol monoalkyl ether disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use glycol monoalkyl ether in Nadolsky in order to produce ink or pigment dispersion that does not clog the printer nozzles and possesses improved moisture retention and storage stability, and thereby arrive at the claimed invention.

5. Claims 5, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nadolsky (U.S. 6,841,592) in view of Yatake (U.S. 6,890,378).

The disclosure with respect to Nadolsky in paragraph 2 above is incorporated here by reference.

The difference between Nadolsky and the present claimed invention is the requirement in the claims of number average molecular weight of the dispersant.

Yatake, which is drawn to inks, discloses the use of dispersant possessing number average molecular weight (Mn) of 100-50,000 and discloses that if Mn is less, printing non-uniformities appear and if Mn is higher, ink viscosity increases and discharge stability deteriorates (col.14, lines 33-40).

In light of the motivation for using dispersant with specific Mn disclosed by Yatake as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such molecular weight, including that presently claimed, in Nadolsky in order to produce ink that possesses good discharge stability and does not exhibit any printing non-uniformities, and thereby arrive at the claimed invention.

6. Claims 6, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nadolsky (U.S. 6,841,592) in view of Satake et al. (U.S. 5,814,685).

The disclosure with respect to Nadolsky in paragraph 2 above is incorporated here by reference.

The difference between Nadolsky and the present claimed invention is the requirement in the claims of acid number of the dispersant.

Satake et al., which is drawn to inks, disclose the use of dispersant possessing acid number of 50-200 and disclose that if the acid number is lower, stability is lowered and if the acid number is higher, water resistance of printed matter decreases (col.4, line 62-col.5, line 1).

In light of the motivation for using dispersant with specific acid number disclosed by Satake et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such acid number in Nadolsky in order to produce ink or pigment dispersion with good stability wherein the ink possesses good water resistance, and thereby arrive at the claimed invention.

7. Claims 1, 3-4, 8, 10-11, 14, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz (U.S. 6,433,039) in view of either Wild et al. (U.S. 5,310,806) or Ueda et al. (U.S. 4,810,612).

Schwarz discloses ink jet ink comprising aqueous pigment dispersion formed by dispersing a maleic anhydride/ α -olefin copolymer in water in the presence of aqueous medium, base, and pigment. It is disclosed that the aqueous medium includes water and organic solvent, i.e. humectant. It is further disclosed that the ink comprises 1-20% pigment, 0.04-4% copolymer, and 80-99.9% aqueous medium comprising ratio of water to solvent of 97:3 to 40:60 from which it is calculated that the ink comprises approximately 32-97% water and 2.4-54% organic solvent (col.1, lines 6-11, col.5, lines 30-31, col.6, lines 52-58, col.8, lines 14-15, col.9, lines 66-67, col.10, line 66-col.11, line 6, and example I).

The difference between Schwarz and the present claimed invention is the requirement in the claims of specific dispersant.

Schwarz discloses the use of dispersant that is maleic anhydride/ α -olefin copolymer while the present claims require dispersant that is monoalkyl maleate graft polymer of maleic anhydride/ α -olefin copolymer.

Wild et al. teach grafting ethylene polymer with monopropyl maleate or mono-2-ethylhexyl maleate in order to produce polymer with excellent adhesivity (col.3, lines 47-57 and col.4, line 6-col.5, line 5) which is especially relevant to inks where it is important that the ink have good adhesion to paper so that the ink does not smear or smudge.

Alternatively, Ueda et al. disclose composition comprising polyolefin grafted with not only maleic anhydride but also with monoalkyl maleate such as monopropyl maleate or monobutyl maleate in order to produce composition with excellent fixability to paper and excellent bending resistance (col.2, lines 47-58 and 63-64, col.3, lines 3-4 and 13-17, col.5, lines 30-31 and 56-57, col.6, lines 22-27 and 59, and col.10, lines 4-5 and 10-11) which is especially relevant to inks where it is important that the ink have good fixability to paper so that the ink does not smear or smudge and have good bending resistance so that the ink does not crack when the substrate on which it is utilized (i.e. paper) is bent, folded, etc.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to graft monoalkyl maleate to the maleic anhydride/ α -olefin copolymer of Schwarz in order to produce pigment dispersion or ink with excellent adhesivity or, alternatively, excellent fixability and bending resistance, and thereby arrive at the claimed invention.

8. Claims 2, 7, 9, 15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz in view of either Wild et al. or Ueda et al. as applied to claims 1, 3-4, 8, 10-11, 14, and 16-17 above, and further in view of Ohta et al. (U.S. 5,954,866).

The difference between Schwarz in view of either Wild et al. or Ueda et al. and the present claimed invention is the requirement in the claims of (a) glycol monoalkyl ether and (b) amounts of pigment, polymer, water, and glycol monoalkyl ether present in the pigment dispersion.

With respect to difference (a), Schwarz discloses that the pigment dispersion or ink comprises aqueous medium including organic solvent, i.e. humectant, however, there is no disclosure of glycol monoalkyl ether as presently claimed.

Ohta et al., which is drawn to inks, disclose the use of humectant such as triethylene glycol monobutyl ether in order to prevent clogging of the printer nozzles and improve moisture retention and storage stability (col.8, lines 36-39 and 42-49). Ohta et al. also disclose the equivalence and interchangeability of humectant that is ethylene glycol, as disclosed by Schwarz, and triethylene glycol monobutyl ether, i.e. glycol monoalkyl ether, as presently claimed.

With respect to difference (b), it is noted that it is calculated from present claim 7 or 20, that the presently claimed pigment dispersion comprises approximately 0.9-23% graft polymer, 0.9-17% glycol monoalkyl ether, 46-77% water, and 16-29% pigment while Schwarz discloses the use of 1-20% pigment, 0.04-4% polymer, and 80-99.9% aqueous medium comprising ratio of water to solvent of 97:3 to 40:60 from which it is calculated that the ink comprises approximately 32-97% water and 2.4-54% organic solvent. However, the amounts of Schwarz are based on the amount of ink and not the pigment dispersion.

However, from the examples of Schwarz, it is clear that after producing the pigment dispersion, only water and additive are further added in order to form the ink. Thus, the amounts of pigment, solvent, and polymer disclosed by Schwarz for the ink would increase while the amount of water would decrease based on the pigment dispersion given that the pigment dispersion contains less water than the ink. It would have been within the skill level of one of ordinary skill in the art to choose amounts of water depending on the desired properties of the ink, i.e. viscosity, surface tension, etc.

In light of the above and given broad amounts of pigment, polymer, water, and solvent disclosed by Schwarz in the ink, it therefore would have been obvious to one of ordinary skill in the art that when based on the pigment dispersion the amounts of pigment, polymer, water, and solvent would intrinsically overlap those presently claimed.

In light of the motivation for using glycol monoalkyl ether disclosed by Ohta et al. as described above and given the broad amounts of pigment, polymer, water, and solvent disclosed by Schwarz in the ink, it therefore would have been obvious to one of ordinary skill in the art (i) to use glycol monoalkyl ether in Schwarz in order to produce ink or pigment dispersion that does not clog the printer nozzles and possesses improved moisture retention and storage stability and (ii) that the amounts of pigment, polymer, water, and solvent in Schwarz would intrinsically overlap those presently claimed, and thereby arrive at the claimed invention.

9. Claims 5, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz in view of either Wild et al. or Ueda et al. as applied to claims 1, 3-4, 8, 10-11, 14, and 16-17 above, and further in view of Yatake (U.S. 6,890,378).

The difference between Schwarz in view of either Wild et al. or Ueda et al. and the present claimed invention is the requirement in the claims of number average molecular weight of the dispersant.

Yatake, which is drawn to inks, discloses the use of dispersant possessing number average molecular weight (Mn) of 100-50,000 and discloses that if Mn is less, printing non-uniformities appear and if Mn is higher, ink viscosity increases and discharge stability deteriorates (col.14, lines 33-40).

In light of the motivation for using dispersant with specific Mn disclosed by Yatake as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such molecular weight, including that presently claimed, in Schwarz in order to produce ink that possesses good discharge stability and does not exhibit any printing non-uniformities, and thereby arrive at the claimed invention.

10. Claims 6, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz in view of either Wild et al. or Ueda et al. as applied to claims 1, 3-4, 8, 10-11, 14, and 16-17 above, and further in view of Satake et al. (U.S. 5,814,685)

The difference between Schwarz in view of either Wild et al. or Ueda et al. and the present claimed invention is the requirement in the claims of acid number of the dispersant.

Satake et al., which is drawn to inks, disclose the use of dispersant possessing acid number of 50-200 and disclose that if the acid number is lower, stability is lowered and if the acid number is higher, water resistance of printed matter decreases (col.4, line 62-col.5, line 1).

In light of the motivation for using dispersant with specific acid number disclosed by Satake et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such acid number in Schwarz in order to produce ink or pigment dispersion with good stability wherein the ink possesses good water resistance, and thereby arrive at the claimed invention.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 1714

Aglietto et al. (U.S. 6,451,919) disclose molding composition comprising polyethylene or polypropylene having maleic anhydride and monoalkyl maleate grafted thereto.

Williams et al. (U.S. 2004/0249014) disclose adhesion promoters formed by reacting polyolefin with maleic anhydride and dialkyl maleate.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho
Primary Examiner
Art Unit 1714